FCC Test Report

Rexon Technology Co., LTD. VHF portable handheld radio, Model: PJ2+

In accordance with FCC 47 CFR Part 2 and FCC 47 CFR Part 87 (VHF)

Prepared for: Rexon Technology Co., LTD. No. 261 Jenhua Rd. Dali Dist Taichung City 412 Taiwan



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FCC ID: I7OPJ22

COMMERCIAL-IN-CONFIDENCE

Document 75955568-02 Issue 03

SIGNATURE			
5 MM			
NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Steve Marshall	Senior Engineer (RF)	Authorised Signatory	13 October 2022

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD document control rules.

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 2 and FCC 47 CFR Part 87. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Neil Rousell	13 October 2022	John
Testing	Graeme Lawler	13 October 2022	Gt Anwler.

FCC Accreditation

90987 Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 2: 2020 and FCC 47 CFR Part 87: 2020 for the tests detailed in section 1.3.



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1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	14 September 2022
2	Amend FCC ID and model number	27 September 2022
3	To amend the manufacturer's name and address.	13 October 2022

Table 1

1.2 Introduction

Applicant	Rexon Technology Co., LTD		
Manufacturer	Rexon Technology Co., LTD		
Model Number(s)	PJ2+		
Serial Number(s)	Not serialised Storix ID (650288-002) and Not serialised Storix ID (650288-003)		
Hardware Version(s)	PJ2+_0.2.0.05		
Software Version(s)	PJ2+_Factory_0.0.0.9_1 test.set		
Number of Samples Tested	2		
Test Specification/Issue/Date	FCC 47 CFR Part 2: 2020 FCC 47 CFR Part 87: 2020		
Order Number Date	Signed QAF 12-May-2022		
Date of Receipt of EUT	17-May-2022		
Start of Test	14-June-2022		
Finish of Test	07-August-2022		
Name of Engineer(s)	Neil Rousell and Graeme Lawler		
Related Document(s)	KDB 971168 D01 v03r01		
	ANSI C63.26 (2015)		



1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 2 and FCC 47 CFR Part 87 is shown below.

Contine	Specificati	ion Clause	Test Description	Deput	Commonto/Ross Standard
Section	FCC Part 2	FCC Part 87	Test Description	Result	Comments/base Standard
Configuration and Mode: VHF transmitter					
2.1	2.1046	87.131	Power and Emissions	Pass	
2.2	2.1055	87.133	Frequency Stability	Pass	
2.3	2.1049	87.135	Bandwidth of Emission	Pass	
2.4	2.1051	87.139	Spurious Emissions at Antenna Terminals	Pass	
2.5	2.1051	87.139	Radiated Spurious Emissions	Pass	
2.6	2.1047	87.141	Modulation Requirements	Pass	

Table 2



1.4 Application Form

Equipment Description

Technical Description: (Please provide a brief description of the intended use of the equipment including the technologies the product supports)	Aviation Portable Radio	
Manufacturer:	Rexon Techno	logy Co., LTD
Model:	PJ2+	
Part Number:		
Hardware Version: PJ2+_0.2.0.05		
Software Version: PJ2+_Factory_		_0.0.0.9_1 test.set
FCC ID of the product under test – see guidance here		I7OPJ22
IC ID of the product under test – see guidance here		

Table 3

Intentional Radiators

Technology	Aviation Portable Radio			
Frequency Range (MHz to MHz)	118.000~136 .975			
Conducted Declared Output Power (dBm)	32.55			
Antenna Gain (dBi)	0			
Supported Bandwidth(s) (MHz) (e.g. 1 MHz, 20 MHz, 40 MHz)	25 kHz			
Modulation Scheme(s) (e.g. GFSK, QPSK etc)	Amplitude Modulation			
ITU Emission Designator (see guidance here) (not mandatory for Part 15 devices)	6K00A3E			
Bottom Frequency (MHz)	118.000			
Middle Frequency (MHz)	127.500			
Top Frequency (MHz)	136.975			

Table 4

Un-intentional Radiators

Highest frequency generated or used in the device or on which the device operates or tunes	209.625 MHz	
Lowest frequency generated or used in the device or on which the device operates or tunes	118.000 MHz	
Class A Digital Device (Use in commercial, industrial or business environment)		
Class B Digital Device (Use in residential environment only) \Box		

Table 5



AC Power Source

AC supply frequency:	50/60	Hz
Voltage	100~240	V
Max current:	0.8	A
Single Phase Three Phase		

Table 6

DC Power Source

Nominal voltage:	9.0	V
Extreme upper voltage:	9.6	V
Extreme lower voltage:	7.2	V
Max current:	1.5	A

Table 7

Battery Power Source

Voltage:	9.0		V
End-point voltage:	7.2		V (Point at which the battery will terminate)
Alkaline $ extsf{D}$ Leclanche $ extsf{D}$ Lithium $ extsf{D}$ Nicke	l Cadmium 🗆 Lead Aci	d* □ *(Vehicle reg	ulated)
Other	Please detail:		

Table 8

Charging

Can the EUT transmit whilst being charged	Yes 🗆 No 🖂
-------------------------------------------	------------

Table 9

Temperature

Minimum temperature:	-30	°C
Maximum temperature:	+50	°C

Table 10

Cable Loss

Adapter Cable Loss	dB
(Conducted sample)	

Table 11



Antenna Characteristics

Antenna connector 🛛		State impedance	50	Ohm	
Temporary antenna conne	ector 🗆		State impedance		Ohm
Integral antenna 🗆	Type:		Gain		dBi
External antenna \Box	Type:	Helical	Gain	0	dBi
For external antenna only: Standard Antenna Jack If yes, describe how user is prohibited from changing antenna (if not professional installed): BNC Standard Antenna Jack (line 2): The Radio has standard BNC connector with Helical antenna(BNC connector) Equipment is only ever professionally installed INC Non-standard Antenna Jack INC				stalled): BNC	

Table 12

Ancillaries (if applicable)

Manufacturer:	Part Number:	
Model:	Country of Origin:	

Table 13

I hereby declare that the information supplied is correct and complete.

Name: Maurice Ma Position held: RD manager Date: 26 May 2022



1.5 Product Information

1.5.1 Technical Description

Aviation Portable Radio.

1.6 Deviations from the Standard

No deviations from the applicable test standard were made during testing.

1.7 EUT Modification Record

The table below details modifications made to the EUT during the test programme.

The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted	
Model: PJ2+, Serial Number: Not serialised Storix ID (650288-002)				
0	As supplied by the customer	Not Applicable	Not Applicable	
Model: PJ2+, Serial Number: Not serialised Storix ID (650288-003)				
0	As supplied by the customer	Not Applicable	Not Applicable	

Table 14

1.8 Test Location

TÜV SÜD conducted the following tests at our Fareham Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation		
Configuration and Mode: VHF transmitter				
Power and Emissions	Neil Rousell	UKAS		
Frequency Stability	Neil Rousell	UKAS		
Bandwidth of Emission	Neil Rousell	UKAS		
Spurious Emissions at Antenna Terminals	Neil Rousell	UKAS		
Radiated Spurious Emissions	Graeme Lawler	UKAS		
Modulation Requirements	Neil Rousell	UKAS		

Table 15

Office Address:

TÜV SÜD Octagon House Concorde Way Fareham Hampshire PO15 5RL United Kingdom



2 Test Details

2.1 Power and Emissions

2.1.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1046 FCC 47 CFR Part 87, Clause 87.131

2.1.2 Equipment Under Test and Modification State

PJ2+, S/N: Not serialised Storix ID (650288-002) - Modification State 0

2.1.3 Date of Test

14-June-2022

2.1.4 Test Method

This test was performed in accordance with ANSI C63.26, clause 5.2.3.3.

2.1.5 Environmental Conditions

Ambient Temperature23.4 °CRelative Humidity49.4 %



2.1.6 Test Results

VHF transmitter

118.00	00 MHz	127.500 MHz		136.97	′5 MHz
Maximum Power (dBm)	Maximum Power (W)	Maximum Power (dBm)	Maximum Power (W)	Maximum Power (dBm)	Maximum Power (W)
37.1	5.129	36.6	4.571	36.2	4.169

Table 16 - Power Results

FCC 47 CFR Part 87, Limit Clause 87.131

<10 W

2.1.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
Audio Analyser	Hewlett Packard	8903B	1350	12	04-Feb-2023
Attenuator (30dB, 150W)	Narda	769-30	3369	12	26-Jul-2022
True RMS Multimeter	Fluke	179	4006	12	29-Mar-2023
Frequency Standard	Spectracom	SecureSync 1200- 0408-0601	4393	6	30-Jun-2022
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	24-Nov-2022
Quad Power Supply	Rohde & Schwarz	HMP4040	4954	-	O/P Mon
Network Analyser	Keysight Technologies	E5063A	5018	12	30-Jul-2022
Electronic Calibration Module	Keysight Technologies	85093C	5188	12	22-Jul-2022
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5475	12	25-Apr-2023

Table 17

O/P Mon - Output Monitored using calibrated equipment



2.2 Frequency Stability

2.2.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1055 FCC 47 CFR Part 87, Clause 87.133

2.2.2 Equipment Under Test and Modification State

PJ2+, S/N: Not serialised Storix ID (650288-002) - Modification State 0

2.2.3 Date of Test

15-June-2022 to 16-June-2022

2.2.4 Test Method

This test was performed in accordance with KDB 971168 D01, clause 9 and FCC 47 CFR Part 2.1055.

2.2.5 Environmental Conditions

Ambient Temperature	22.9 - 23.3 °C
Relative Humidity	46.3 - 50.3 %



2.2.6 Test Results

VHF transmitter

Voltage	Frequency Error (ppm)			
	118.000 MHz	127.500 MHz	136.975 MHz	
7.2	-0.54	-0.53	-0.54	
9.6	-0.53	-0.53	-0.53	

Table 18 - Frequency Stability Under Voltage Variations

Temperature	Frequency Error (ppm)			
	118.000 MHz	127.500 MHz	136.975 MHz	
50 °C	-0.54	-0.54	-0.55	
40 °C	-0.56	-0.56	-0.56	
30 °C	-0.59	-0.59	-0.59	
20 °C	-0.54	-0.53	-0.54	
10 °C	-0.51	-0.52	-0.52	
0 °C	-0.58	-0.58	-0.58	
-10 °C	-0.71	-0.70	-0.72	
-20 °C	-0.78	-0.77	-0.77	
-30 °C	-0.81	-0.77	-0.77	

Table 19 - Frequency Stability Under Temperature Variations

FCC 47 CFR Part 87, Limit Clause 87.133

30 ppm



2.2.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

Instrument	Manufacturer	Туре No.	TE No.	Calibration Period (months)	Calibration Expiry Date
Modulation Analyser	Hewlett Packard	8901B	45	12	26-May-2023
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
Sensor	Hewlett Packard	11722A	493	12	25-Aug-2022
Digital Temperature Indicator	Fluke	51	1385	12	12-Apr-2023
Attenuator (30dB, 150W)	Narda	769-30	3369	12	26-Jul-2022
True RMS Multimeter	Fluke	179	4006	12	29-Mar-2023
Frequency Standard	Spectracom	SecureSync 1200- 0408-0601	4393	6	30-Jun-2022
Quad Power Supply	Rohde & Schwarz	HMP4040	4954	-	O/P Mon
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5475	12	25-Apr-2023

Table 20

O/P Mon – Output Monitored using calibrated equipment



2.3 Bandwidth of Emission

2.3.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1049 FCC 47 CFR Part 87, Clause 87.135

2.3.2 Equipment Under Test and Modification State

PJ2+, S/N: Not serialised Storix ID (650288-002) - Modification State 0

2.3.3 Date of Test

14-June-2022

2.3.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 5.4.4 and FCC 47 CFR Part 2.1049 to measure the 99% occupied bandwidth.

2.3.5 Environmental Conditions

Ambient Temperature	23.2 °C
Relative Humidity	38.8 %



2.3.6 Test Results

VHF transmitter

99% Occupied Bandwidth (kHz)									
118.000 MHz	118.000 MHz 127.500 MHz 136.975 MHz								
5.1	5.1	5.1							

Table 21 - Occupied Bandwidth Results

🔤 Keysight:	Spectrum Analyzer - Occupied	BW								- d ×
CX RL	RF 50 Ω DC			SENSE:EXT SOUR	q: 118.000000 N	GN AUTO		R	02:30:5	3 PM Jun 14, 2022
		NFE #I	FGain:Low	. Trig: Free #Atten: 16	Run dB	Avg Hold::	200/200	R	adio Devic	e: BTS
15 dB/div	Ref 60.40 di	Bm								
45.4										
30.4										
15.4		<u>A</u>			\		-f			
D.400	~	\mathbb{H}			4					
-14.6				and	- hand		1	Ľ.	~	
-29.6			~~~~~	Ť	~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			- www	m
-44.6 59.6										
-74.6										
Center Res BW	118.000000 MHz / 82 Hz			#VE	W 470 Hz				Spar S	n 9.000 kHz Sweep FFT
Occ	upied Bandwid	dth		Total P	ower	33.7 d	Bm			
		5.132	kHz							
Tran	smit Freq Error		-68 Hz	% of O	3W Power	99.00) %			
x dB	Bandwidth	5.2	09 kHz	x dB		-26.00	dB			
MSG						STATUS				

Figure 1 - Occupied Bandwidth - 118.000 MHz



Keysight Spectr R L	rum Analyzer - Occupied RF 50 Ω DC	BW		SENSE:EXT SOUR	CE OFF ALL	GN AUTO			02:29:3 Radio Std: N	6 PM Jun 14, 20
		NFE #	→ IFGain:Low	, Trig: Free #Atten: 16	Run dB	Avg Hold: 2	200/200		Radio Devic	e: BTS
5 dB/div	Ref 60.40 dE	<u>3m</u>						·		
5.4										
5.4		h		\wedge			ſ			
		$\langle \cdot \rangle$			L_					
.6		- ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			- Jones			M	5	
6	m								- v	
6										
.6										
enter 127. es BW 82	.500000 MHz 2 Hz			#VE	W 470 Hz				Spar S	1 9.000 kl sweep FF
Occupi	ed Bandwid	dth		Total P	ower	33.3 di	Зm			
		5.133	kHz							
Transmi	it Freq Error		-75 Hz	% of O	BW Power	99.00) %			
x dB Ba	ndwidth	5.2	207 kHz	x dB		-26.00	dB			
i						STATUS				





Figure 3 - Occupied Bandwidth - 136.975 MHz

FCC 47 CFR Part 87, Limit Clause 87.135(a)

The authorized bandwidth is the maximum occupied bandwidth authorized to be used by a station.

The authorized bandwidth declared by the manufacturer is: < 25 kHz.



2.3.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

Instrument	Manufacturer	Туре No.	TE No.	Calibration Period (months)	Calibration Expiry Date
Modulation Analyser	Hewlett Packard	8901B	45	12	26-May-2023
Sensor	Hewlett Packard	11722A	493	12	25-Aug-2022
Audio Analyser	Hewlett Packard	8903B	1350	12	04-Feb-2023
Attenuator (30dB, 150W)	Narda	769-30	3369	12	26-Jul-2022
True RMS Multimeter	Fluke	179	4006	12	29-Mar-2023
Frequency Standard	Spectracom	SecureSync 1200- 0408-0601	4393	6	30-Jun-2022
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	24-Nov-2022
Quad Power Supply	Rohde & Schwarz	HMP4040	4954	-	O/P Mon
Network Analyser	Keysight Technologies	E5063A	5018	12	30-Jul-2022
Electronic Calibration Module	Keysight Technologies	85093C	5188	12	22-Jul-2022
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5475	12	25-Apr-2023

Table 22

O/P Mon - Output Monitored using calibrated equipment



2.4 Spurious Emissions at Antenna Terminals

2.4.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1051 FCC 47 CFR Part 87, Clause 87.139

2.4.2 Equipment Under Test and Modification State

PJ2+, S/N: Not serialised Storix ID (650288-002) - Modification State 0

2.4.3 Date of Test

14-June-2022 to 15-June-2022

2.4.4 Test Method

This test was performed in accordance with KDB 971168 D01, clause 6.

2.4.5 Environmental Conditions

Ambient Temperature	23.0 - 24.8 °C
Relative Humidity	44.4 - 46.3 %



2.4.6 Test Results

VHF transmitter



Figure 4 - 118.000 MHz - Transmitter Spectrum Mask



Figure 5 - 127.500 MHz - Transmitter Spectrum Mask



Ke R	ysight Spec	trum Ai RF	nalyzer - Swept SA 50 Ω DC			SENSE:EXT SOUR	RCE OFF AL	IGN AUTO		10:14:46	AM Jun 15, 202
PAS	S]		NFE	PNO: Close ++ IFGain:Low	. Trig: Free #Atten: 22	Run dB	Avg Type: Avg Hold: 3	Log-Pwr 300/300	TF	TYPE MWWWM DET P NNNN
0 dE	3/div	Ref (Ref	Offset 30.4 dE 31.96 dBm	3					Mkr1	136.975 31.	000 MH 951 dBr
og	Trace	1 Pa	ISS				1				
22.0											
2.0											
.96							<u> </u>				
04					-	N	M.				
.0							4				
.0						1					
3.0					- N	V	1	\sim			
.0								where the second			
	~~~~	~~^^	$\sim$	$\sim$					m	$\sim \sim \sim$	$\sim$
5.U											
en es	ter 136 BW 1.3	i.975 2 kH	00 MHz z		#VB	W 3.6 kHz	•	1	Sweep	Spar 0 1.800 ms	i 125.0 kH 6 (1001 pf
G								STATUS			





Figure 7 - 118.000 MHz - 9 kHz to 150 kHz



K	evsight Spe	ctrum Ar	nalvzer - Swept SA								
LXI F	RL	RF	50 Ω DC			SENSE:EXT SOUR	CE OFF AL	IGN AUTO		04:45:24	PM Jun 14, 2022
Mai	rker 1	12.5	25000 kHz	Z NFE P	NO: Close ↔	. Trig: Free #Atten: 26	Run dB	Avg Type: Avg Hold: 3	Log-Pwr 300/300	TR	ACE 1 2 3 4 5 6 TYPE MWWWW DET P NNNNN
10 d	B/div	Ref C <b>Ref</b>	)ffset 30 dB 31.02 dBm	1						Mkr1 12 -54.	2.525 kHz 531 dBm
-•s											
21.0	)										
11.0	)										
1.02	2										
-8.98											DL1 -13.00 dBm
-19.0											
-29.0	ı —										
-39.0											
-49.0	L_1-										
-59.0	La	$\sim$	$\sim \sim $	$\sim$	Am	$\sim\sim\sim\sim\sim$	ᠬ᠆᠆᠆᠆	$\sim \sim $	m	$\sim \sim $	ᡗᢦᢦᢑᢦ᠆ᡡ
Sta #Re	rt 9.00 es BW	кHz 1.0 kł	Ηz		#VB	W 3.0 kHz			Sweep	Stop 2.867 ms	150.00 kHz (1001 pts)
MSG								STATUS			

Figure 8 - 127.500 MHz - 9 kHz to 150 kHz



Figure 9 - 136.975 MHz - 9 kHz to 150 kHz



🔤 Keysight S	pectrum Analyzer - Swept	SA							
LXI RL	RF 50 Ω	DC		SENSE:EXT SOUR	RCE OFF AL	IGN AUTO		04:56:23	PM Jun 14, 2022
Marker	1 27.28365000	NFE	PNO: Wide ++ IFGain:Low	Trig: Free #Atten: 26	Run dB	Avg Type: Avg Hold: (	Log-Pwr 500/500	TR	ACE 1 2 3 4 5 6 YPE MWWWW DET P NNNN
10 dB/div	Ref Offset 30.2 Ref 31.22 dE	dB Sm						Mkr1 27. -45.	284 MHz 785 dBm
					Ĭ				
21.2									
11.2									
1.22									
-8.78									DL1 -13.00 dBm
-18.8									
-28.8									
-38.8									
	المرابعة المرابع		libele of a	الرمانية مرار	منبا الل			المتعادية ال	↓ ¹
-40.0	al haile. O tolia de la selecciól de la s	and an allowed here	ակչներ	لحميل إطرياه ويتفكر وترجيهم	anteres l'Artes fai en	adalah kalang kalang Kalang kalang	********	ili bili bili bili bili bili bili bili	apatelista in the state of the st
-58.8									
Start 15	0 kHz				1		<u> </u>	Stop	30.00 MHz
#Res BI/ MSG	V 10 KH2		#vB	WV JU KHZ		STATUS	Sweep	0 0.333 MS	(1001 pts)





Figure 11 - 127.500 MHz - 150 kHz to 30 MHz



Keys	ight Spectrum A	nalyzer - Swept SA								- 6 💌
Mark	er 1 28.5	97050000	MHz		SENSE:EXT  SOUF	CEOFF AL	Avg Type:	Log-Pwr	04:58:06 TR	PM Jun 14, 2022 RACE 1 2 3 4 5 6
			NFE P	NO: Wide ++ Gain:Low	. Trig: Free #Atten: 26	Run dB	Avg Hold: 5	500/500		DET P NNNN
10 dBi	Ref /div <b>Ref</b>	Offset 30.2 dE 31.22 dBm	3						Mkr1 28 -47.	.597 MHz 010 dBm
3						Ĭ				
21.2										
11.2										
1.22										
-8.78 -										DI 1 -13 00 dBm
-18.8										DET STOLOG GEM
-28.8										
-38.8 -										
-48.8 4	nan langerta	สายาสะสาย	-	(Intraling to the set of the set		with water with	Algorithese and a state of the	- in-malentificity	gentlematikerapyerisphe	
58.8										
30.0										
Start #Res	150 kHz BW 10 kł	Hz		#VB	W 30 kHz			Sweep	Stop 6.333 ms	30.00 MHz (1001 pts)
MSG							STATUS			





Figure 13 - 118.000 MHz - 30 MHz to 1 GHz



Keysight	Spectrum Analyzer - Swe	pt SA		CENCE EXT COUR				05:02:22	- @ X
Marker	<u>1 127.000000</u>	1000 MHz NFE	PNO: Fast	Trig: Free # #Atten: 26	Run dB	Avg Type: Avg Hold: 2	Log-Pwr 2000/2000	US:U2:36 TR 1	TYPE M WWWW DET P N N N N
10 dB/div	Ref Offset 31 Ref 42.02 d	dB Bm						Mkr1 12 37.	7.00 MHz 912 dBm
	<b>♥</b> 1								
32.0									
22.0									
12.0									
2.02									
-7.98									
-18.0									DET -13.00 dBm
-28.0									
-38.0 <b>ubus</b>	wanner Janigan	manulantura	hundrech to the second		an shulasharan	then here when the	u wangene waar	etalitarialla social	wormhandhaithe
-48.0									
Start 0.0 #Res Bi	0300 GHz N 100 kHz		#VB	W 300 kHz			Sweep	Stop 1 3.200 ms	.0000 GHz (1001 pts)
MSG						STATUS			

Figure 14 - 127.500 MHz - 30 MHz to 1 GHz



Figure 15 - 136.975 MHz - 30 MHz to 1 GHz



Keysight S	pectrum Analyzer - Swept	SA							
X RL	RF 50 Ω			SENSE:EXT  SOUP	RCE OFF AL	IGN AUTO	Log Dur	05:06:16	PMJun 14, 2022
Marker	1 1.960000000	NFE	PNO: Fast ++	Trig: Free #Atten: 16	Run dB	Avg Hold: 3	3000/3000	1	DET P NNNN
10 dB/div	Ref Offset 31.3 Ref 37.30 dB	dB m			-			Mkr1 1 -33.	.960 GHz 172 dBm
27.3									
17.3									
7.30									
-2.70									
-12.7									DL1 -13.00 dBr
-22.7									
-32.7									<b>1</b>
within	an mention and relations	heldsonarth		whenly	แก้เพรงไหนสมส _า หา	<b>ใ</b> ประชาวปีเหรืองไห	wanghabaranah	elizanet,engrande	
-42.7									
-52.7									
Start 1.0	Start 1.0000 GHz Stop 2.0000 GHz								
#Res BW	/ 1.0 MHz		#VB	W 3.0 MHz			Sweep	0 1.000 ms	; (1001 pts)
MSG						STATUS			

Figure 16 - 118.000 MHz - 1 GHz to 2 GHz



Figure 17 - 127.500 MHz - 1 GHz to 2 GHz



R L	RF	50 Ω DC			SENSE:EXT SOUR	ICE OFF AL		Log-Pwr	05:08:27	7 PM Jun 14, 20
arker	1 1.900	0000000	NFE	PNO: Fast ++ IFGain:Low	Trig: Free #Atten: 16	Run dB	Avg Hold:	3000/3000		DET P N N N
dB/di	RefOf v <b>Ref</b> 3	ffset 31.3 dE 1 <b>7.30 dBm</b>	3						Mkr1 1 -32.	.906 GH 970 dB
,										
7.3										
7.3										
7.30										
2.70										
2.7										DL1 -13.00 (
2.7										
0.7										<b>●</b> ¹
40.5J	Numuna	noton and and	unar Nation and pairs	allaninalaura	Hallow with many and	Fullyhytyte blive en a	un and in the second	yun haylenn ylefy	พุฑระสุย _{ประส} ารเขาง	huddhaireirean
12.7										
52.7										
									<b>01</b> (	
tart 1. Res B	0000 GH: W 1.0 MH	z Iz		#VE	3W 3.0 MHz			Sweep	Stop 2 0 1.000 ms	2.0000 GH s (1001 pt
3G							STATUS			

Figure 18 - 136.975 MHz - 1 GHz to 4 GHz

#### FCC 47 CFR Part 87, Limit Clause 87.139 (a)

Except for ELTs and when using single sideband (R3E, H3E, J3E), or frequency modulation (F9) or digital modulation (F9Y) for telemetry or telecommand in the 1435-1525 MHz, 2345-2395 MHz, or 5091–5150 MHz band or digital modulation (G7D) for differential GPS, the mean power of any emissions must be attenuated below the mean power of the transmitter (pY) as follows:

(1) When the frequency is removed from the assigned frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth the attenuation must be at least 25 dB;

(2) When the frequency is removed from the assigned frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth the attenuation must be at least 35 dB.

(3) When the frequency is removed from the assigned frequency by more than 250 percent of the authorized bandwidth the attenuation for aircraft station transmitters must be at least 40 dB; and the attenuation for aeronautical station transmitters must be at least 43 + 10 log10 pY dB.



#### 2.4.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
Dual Power Supply Unit	Hewlett Packard	6253A	292	-	O/P Mon
Audio Analyser	Hewlett Packard	8903B	1350	12	04-Feb-2023
Attenuator (30dB, 150W)	Narda	769-30	3369	12	26-Jul-2022
True RMS Multimeter	Fluke	179	4006	12	29-Mar-2023
Frequency Standard	Spectracom	SecureSync 1200- 0408-0601	4393	6	30-Jun-2022
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	24-Nov-2022
Quad Power Supply	Rohde & Schwarz	HMP4040	4954	-	O/P Mon
Network Analyser	Keysight Technologies	E5063A	5018	12	30-Jul-2022
Electronic Calibration Module	Keysight Technologies	85093C	5188	12	22-Jul-2022
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5475	12	25-Apr-2023

#### Table 23

O/P Mon - Output Monitored using calibrated equipment



#### 2.5 Radiated Spurious Emissions

#### 2.5.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1051 FCC 47 CFR Part 87, Clause 87.139

#### 2.5.2 Equipment Under Test and Modification State

PJ2+, S/N: Not serialised Storix ID (650288-003) - Modification State 0

#### 2.5.3 Date of Test

07-August-2022

#### 2.5.4 Test Method

This test was performed in accordance with KDB 971168 D01, clause 5.8 and 7.

The transmitter was amplitude modulated to a depth of 80% with a 1 kHz tone.

#### 2.5.5 Environmental Conditions

Ambient Temperature22.2 °CRelative Humidity41.0 %



#### 2.5.6 Test Results

#### VHF transmitter

Frequency (MHz)	Level (dBm)
*	

#### Table 24 - 118.000 MHz - Emissions Results

*No emissions were detected within 10 dB of the limit.



#### Figure 19 - 118.000 MHz - 30 MHz to 2 GHz - Vertical - X Orientation





Figure 20 - 118.000 MHz - 30 MHz to 2 GHz - Horizontal - X Orientation



Figure 21 - 118.000 MHz - 30 MHz to 2 GHz - Vertical - Y Orientation





Figure 22 - 118.000 MHz - 30 MHz to 2 GHz - Horizontal - Y Orientation



Figure 23 - 118.000 MHz - 30 MHz to 2 GHz - Vertical - Z Orientation





Figure 24 - 118.000 MHz - 30 MHz to 2 GHz - Horizontal - Z Orientation



Frequency (MHz)	Level (dBm)
*	

#### Table 25 - 127.500 MHz - Emissions Results

*No emissions were detected within 10 dB of the limit.



Figure 25 - 127.500 MHz - 30 MHz to 2 GHz - Vertical - X Orientation



Figure 26 - 127.500 MHz - 30 MHz to 2 GHz - Horizontal - X Orientation





Figure 27 - 127.500 MHz - 30 MHz to 2 GHz - Vertical - Y Orientation



Figure 28 - 127.500 MHz - 30 MHz to 2 GHz - Horizontal - Y Orientation





Figure 29 - 127.500 MHz - 30 MHz to 2 GHz - Vertical - Z Orientation



Figure 30 - 127.500 MHz - 30 MHz to 2 GHz - Horizontal - Z Orientation



Frequency (MHz)	Level (dBm)
*	

#### Table 26 - 136.975 MHz - Emissions Results



Figure 31 - 136.975 MHz - 30 MHz to 2 GHz - Vertical - X Orientation



Figure 32 - 136.975 MHz - 30 MHz to 2 GHz - Horizontal - X Orientation





Figure 33 - 136.975 MHz - 30 MHz to 2 GHz - Vertical - Y Orientation



Figure 34 - 136.975 MHz - 30 MHz to 2 GHz - Horizontal - Y Orientation





Figure 35 - 136.975 MHz - 30 MHz to 2 GHz - Vertical - Z Orientation



Figure 36 - 136.975 MHz - 30 MHz to 2 GHz - Horizontal - Z Orientation



#### FCC 47 CFR Part 87, Limit Clause 87.139 (a)

Except for ELTs and when using single sideband (R3E, H3E, J3E), or frequency modulation (F9) or digital modulation (F9Y) for telemetry or telecommand in the 1435-1525 MHz, 2345-2395 MHz, or 5091–5150 MHz band or digital modulation (G7D) for differential GPS, the mean power of any emissions must be attenuated below the mean power of the transmitter (pY) as follows:

(1) When the frequency is removed from the assigned frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth the attenuation must be at least 25 dB;

(2) When the frequency is removed from the assigned frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth the attenuation must be at least 35 dB.

(3) When the frequency is removed from the assigned frequency by more than 250 percent of the authorized bandwidth the attenuation for aircraft station transmitters must be at least 40 dB; and the attenuation for aeronautical station transmitters must be at least 43 + 10 log10 pY dB.

#### 2.5.7 Test Location and Test Equipment Used

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
Modulation Analyser	Hewlett Packard	8901B	45	12	26-May-2023
Audio Analyser	Hewlett Packard	8903B	1350	12	04-Feb-2023
Screened Room (5)	Rainford	Rainford	1545	36	15-Apr-2024
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Comb Generator	Schaffner	RSG1000	3034	-	TU
Mast Controller	Maturo Gmbh	NCD	4810	-	TU
Tilt Antenna Mast	Maturo Gmbh	TAM 4.0-P	4811	-	TU
Antenna (DRG 1- 10.5GHz)	Schwarzbeck	BBHA9120B	4848	12	28-May-2023
Cable (sma to sma 2m)	Junkosha	MWX221- 02000AMSAMS/A	5517	12	12-Apr-2023
Cable (N to N 8m)	Junkosha	MWX221- 08000NMSNMS/B	5520	12	24-Mar-2023
EMI Test Receiver	Rohde & Schwarz	ESW44	5527	12	28-Apr-2023
Antenna (Bi-Log, 30 MHz to 1 GHz)	Teseq	CBL6111D	5615	24	16-Oct-2022
Thermo-Hygro- Barometer	PCE Instruments	PCE-THB 40	5604	12	22-Sept-2022

This test was carried out in EMC Chamber 5.



TU – Traceability Unscheduled



#### 2.6 Modulation Requirements

#### 2.6.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1047 FCC 47 CFR Part 87, Clause 87.141

#### 2.6.2 Equipment Under Test and Modification State

PJ2+, S/N: Not serialised Storix ID (650288-002) - Modification State 0

#### 2.6.3 Date of Test

14-June-2022

#### 2.6.4 Test Method

The test was performed in accordance with KDB 971168 D01, clause 3.

#### 2.6.5 Environmental Conditions

Ambient Temperature24.8 °CRelative Humidity44.4 %



#### 2.6.6 Test Results

#### VHF transmitter







Figure 38 - Modulation Limiting – 300 Hz









Figure 40 - Modulation Limiting – 3000 Hz



#### 2.6.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

Instrument	Manufacturer	Туре No.	TE No.	Calibration Period (months)	Calibration Expiry Date
Modulation Analyser	Hewlett Packard	8901B	45	12	26-May-2023
Sensor	Hewlett Packard	11722A	493	12	25-Aug-2022
Audio Analyser	Hewlett Packard	8903B	1350	12	04-Feb-2023
Attenuator (30dB, 150W)	Narda	769-30	3369	12	26-Jul-2022
True RMS Multimeter	Fluke	179	4006	12	29-Mar-2023
Frequency Standard	Spectracom	SecureSync 1200- 0408-0601	4393	6	30-Jun-2022
Quad Power Supply	Rohde & Schwarz	HMP4040	4954	-	O/P Mon
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5475	12	25-Apr-2023

#### Table 28

O/P Mon – Output Monitored using calibrated equipment



# 3 Photographs

#### 3.1 Test Setup Photographs



Figure 41 - Test Setup - 30 MHz to 1 GHz - X Orientation





Figure 42 - Test Setup - 30 MHz to 1 GHz - Y Orientation





Figure 43 - Test Setup - 30 MHz to 1 GHz - Y Orientation





Figure 44 - Test Setup - 1 GHz to 2 GHz - X Orientation





Figure 45 - Test Setup - 1 GHz to 2 GHz - Y Orientation





Figure 46 - Test Setup - 1 GHz to 2 GHz - Z Orientation



# 4 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

Test Name	Measurement Uncertainty
Power and Emissions	± 3.2 dB
Frequency Stability	± 8.03 Hz
Bandwidth of Emission	± 91 Hz
Spurious Emissions at Antenna Terminals	± 3.45 dB
Radiated Spurious Emissions	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 18 GHz: ± 6.3 dB
Modulation Requirements	-

#### Table 29

#### Measurement Uncertainty Decision Rule - Accuracy Method

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115:2007, Clause 4.4.3 and 4.5.1. (Procedure 2). The measurement results are directly compared with the test limit to determine conformance with the requirements of the standard.

Risk: The uncertainty of measurement about the measured result is negligible with regard to the final pass/fail decision. The measurement result can be directly compared with the test limit to determine conformance with the requirement (compare IEC Guide 115). The level of risk to falsely accept and falsely reject items is further described in ILAC-G8.